CLAIMS

What is claimed is:

1. A imaging system, comprising:

(a) an imager having an array of photodetectors, each of which accumulates charge during an integration period as a result of light detected during said integration period, said array having a charge capacity which increases during the integration period; and

(b) a charge capacity controller coupled to said imager which adjusts how the imager increases the charge capacity of the array based upon the brightness distribution detected by said imager during at least one previous integration period.

2. The imaging system of claim 1, wherein:

the imager provides a video frame after the integration period in accordance with the charge accumulated by each photodetector;

the imager increases the charge capacity of the array during the integration period in accordance with a function and function information that specifies how to vary the function;

the charge capacity controller comprises a function generator which generates the function information in accordance with the brightness distribution of at least one previous video frame provided by the imager.

3. The imaging system of claim 2, wherein the charge capacity controller further comprises a histogrammer coupled to the imager and to the function generator, wherein the histogrammer receives video frames provided by the imager and provides a histogram containing the brightness distribution to the function generator.

4. The imaging system of claim 3, wherein the charge capacity controller further comprises a histogram equalization/projection block coupled to the histogrammer and to the imager, wherein the histogram equalization/projection block uses the histogram for a current video frame to optimally display the informational content of the video frame on a monitor.

5. The imaging system of claim 2, wherein the charge capacity controller further comprises a contrast corrector, wherein:

the function generator generates inverse function information; and

the contrast corrector receives video frames provided by the imager, receives the inverse function information provided by the function generator, and uses the inverse function information to remove the effect in video frames caused by the charge capacity of the array of photodetectors being increased during the integration period.

6. The imaging system of claim 2, wherein the imager increases the charge capacity of the array of photodetectors during the integration period by applying a first charge capacity control voltage to the array of photodetectors during a first portion of the integration period and a second charge capacity control voltage to the array of photodetectors after the first portion, wherein the length of the first portion is determined in accordance with the function information provided by the function generator and the second charge capacity control voltage is greater than the first charge capacity control voltage.

7. The imaging system of claim 2, wherein:

the function generator generates the function information in accordance with the brightness distribution of the most recent previous video frame provided by the imager; and

the function information is generated by the function generator so that light having a brightness level of the brightest object in the most recent previous video frame and impinging upon a photodetector of the imager during the integration period will not cause charge to accumulate in excess of the charge capacity of the photodetector at the end of the integration period.

8. The imaging system of claim 7, wherein the function information is generated by the function generator so that the light will cause charge to accumulate that just reaches but does not exceed the charge capacity of the photodetector at the end of the integration period.

9. The imaging system of claim 1, wherein the imager is a complementary metal-oxide semiconductor imager having an array of virtual gate buried n-channel photodetectors, wherein each photodetector has a charge capacity related to the magnitude of a charge capacity control voltage applied to the photodetector.

10. The imaging system of claim 1, wherein the imager comprises an array charge-coupled device (CCD) photodetectors, wherein each CCD photodetector has a charge capacity related to the magnitude of a charge capacity control voltage applied to the CCD photodetector.

11. An imaging system, comprising a charge capacity controller coupled to an imager having an array of photodetectors, each of which accumulates charge during an integration period as a result of light detected during said integration period, said array having a charge capacity which increases during the integration period, wherein the charge capacity controller adjusts how the imager increases the charge capacity of the array based upon the brightness distribution detected by said imager during at least one previous integration period.

12. A method, comprising the steps of:

(a) increasing the charge capacity of an array of photodetectors of an imager during an integration period during which each photodetector accumulates charge as a result of light detected during said integration period; and

(b) adjusting how the charge capacity of the array is increased based upon the brightness distribution detected by the imager during at least one previous integration period.

13. An imaging system, comprising:

(a) means for increasing the charge capacity of an array of photodetectors of an imager during an integration period during which each photodetector accumulates charge as a result of light detected during said integration period; and

(b) means for adjusting how the charge capacity of the array is increased based upon the brightness distribution detected by the imager during at least one previous integration period.

ADD A1